REMARKS

Status of the claims

Claims 1, 4-5, and 7-25 are currently pending. Claims 1, 11, 20, 21 and 22 have been amended by adding the phrase "*and a polymerization catalyst*" to step i). Support for these amendments may be found throughout the application as filed, as it should be clear from the description and the examples that a catalyst must be present in said at least one slurry reactor.

No new matter has been added by these amendments.

Rejections Based on 35 USC § 112:

Claims 1, 4, 5, and 7-25 stand rejected as allegedly failing to comply with the written description requirement. Specifically, it is alleged that "feeding only propylene to at least one slurry reactor" in view of "*in the presence of a polymerization catalyst*" is not taught in the specification. Applicants respectfully disagree.

It should be clear that a catalyst must also be present in the slurry reactor; otherwise, no polymerization occurs. Thus, the previous wording of the claim is fully supported by the description. Nevertheless, in an effort to expedite prosecution, the claims have been amended by adding phrase "*and a polymerization catalyst*" to step i)." As a result, it is now very clear that both propylene and a catalyst are present in the slurry reactor. In light of this amendment, reconsideration and withdrawal of this rejection is respectfully requested.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

Rejections Based on 35 USC § 102(e):

Claims 1, 4, 5, 7-12 and 15-25 stand rejected as allegedly being anticipated by Malm et al. (US 7,279,526). Applicants respectfully disagree.

Malm is directed to heterophasic propylene copolymers. This heterophasic copolymer comprises i) 60 to 90% wt of a propylene polymer matrix consisting of a propylene homopolymer and optionally a propylene copolymer; ii) 5 to 30% wt of an elastomer; and iii) 5 to 25% wt of an ethylene copolymer plastomer (cf. column 1, lines 38-52).

The process for preparing the heterophasic propylene copolymer comprises:

a) polymerising propylene and optionally a further [α]-olefin co-monomer in a first reactor whereby to produce a first polymer;

b) optionally further polymerizing propylene and optionally a further [α]-olefin co-monomer in a further reactor in the presence of said first polymer whereby to produce a mixture of said first polymer and a second polymer;

c) polymerizing at least one [α]-olefin in a gas phase reactor in the presence of said first polymer and where present said second polymer whereby to produce a mixture of said first polymer and where present said second polymer and an elastomer; and

d) blending said mixture of polymer and elastomer with an ethylene copolymer plastomer (cf. column 3, lines 30-50).

In contrast, the process for the preparation of a polypropylene polymer composition with bimodal rubber of the instant claims comprises three main steps:

1.) "*feeding only propylene and a polymerization catalyst to a at least one slurry reactor and producing a polypropylene polymer matrix in the presence of a polymerization catalyst in said at least one slurry reactor*"

2.) "*feeding a first mixture of ethylene and propylene to a first gas phase reactor containing the slurry reactor product and producing a first ethylene/propylene-copolymer in the polymer matrix in the presence of a polymerization catalyst in said first gas phase reactor*"

3.) "*feeding a second mixture of ethylene and propylene to a second gas phase reactor containing the first gas phase reactor product and producing a second ethylene/propylene-copolymer in the polymer matrix in the presence of a polymerization catalyst in said second gas phase reactor*".

There are two ways to interpret the process of Malm and compare it to the present invention. The interpretations will be discussed seriatim below.

The First Interpretation

In the first interpretation, step a) may be compared to step i.), i.e. a homopolypropylene polymer matrix is produced. Consequently, step b) must be compared to step ii.), *i.e.* in step b) propylene is polymerized with a α-olefin in the presence of the first polymer prepared in step a).

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

However, it is explicitly stated in column 3, lines 52-54 of Malm that in steps a) and b) the propylene polymer matrix is produced. Further, in column 3, line 63 to column 4, line 1 it can be learned that the ethylene content of this matrix is up to 5% wt. Contrary to that, the ethylene content of the EPR formed in the step ii.) of the present invention is in the range from 39-74 mol %. Thus, there is a clear difference in the ethylene content and thus between the teaching of Malm and the present invention.

Further, step c) must be compared to step iii.), i.e. a further polymerization of propylene with an α-olefin in the presence of the polymer prepared in step b) is conducted. In step c) the elastomer is produced (cf. column 3, lines 54-56). However, the ethylene content of the elastomer is 25 to 45% wt (cf. column 4, lines 2-14). In the currently pending claims, the resulting amount of ethylene in the EPR formed in the second gas phase reactor is in the range from 77-99.9 mol%. Again, there is a clear difference in the ethylene content and thus between the teaching of Malm and the present invention.

The Second Interpretation

In the second interpretation, the teachings of steps a) and b) of Malm are compared to step i.) of the instant claims, *i.e.* only a homopolypropylene polymer matrix is produced (all other optional polymerizations in steps a) and b) of Malm are not conducted). In this case, step c) has to be compared to step ii.) of the present invention. Consequently, step d) of Malm has to be compared to step iii.) of the present invention.

However, step d) of Malm is the blending of the mixture of polymer and elastomer prepared in steps a) to c) with an ethylene copolymer plastomer (cf. column 3, lines 45-50 and column 4, lines 35-36). This means, the plastomer is polymerized

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

separately and mixed with the other polymers subsequently (cf. column 4, lines 15-26). In contrast, in step iii.) of the instant claims, ethylene and propylene are polymerized in the presence of the product prepared in steps i.) and ii.). This is a completely different approach that leads to very different products.

In light of the above, it is clear that the subject-matter of the instant claims clearly differs from the teachings of Malm, no matter how the Malm reference is interpreted.

Rejections Based on 35 USC § 103:

Claims 1, 4, 5, 7-12 and 15-25 stand rejected as allegedly being obvious over Malm et al. (US 7,279,526) or Huovinen et al. (US 6,503,993). Applicants respectfully disagree.

- Malm et al. (US 7,279,526)

The difference between the teaching of Malm and the presently claimed subject-matter was outlined above.

In case of the first interpretation, i.e. the difference between Malm and the present invention can be seen in the ethylene content of the different polymers. In the instant claims, two rubber parts with highly differentiated molecular weight present in a polypropylene matrix are prepared. As a result, the scratch resistance properties of the obtained polymers should be improved.

Such an approach cannot be taken from Malm. Malm is directed towards polymers with improved impact resistance resulting in improved stress whitening resistance. In column 1 of Malm it is described that "*stress whitening increases with*

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

increased elastomer content while a homopolymer itself generally has a very low stress whitening. As a result the acceptable end uses of heterophasic propylene polymers have been limited to some extent" (cf. column 1, lines 26-30). Thus, the skilled person learns from this paragraph that differences in the composition in a polymer have a considerable impact to the properties of the respective polymer. Further, the skilled man also learns that homopolymers may generally have the best properties with respect to stress whitening, i.e. the content of co-monomers in a heterophasic polypropylene polymer should be kept at a minimum.

Thus, the skilled man would have no motivation to change the ethylene content of the respective polymers in the different stages of Malm in view of the above. There is no reasonable expectation of success because the effect such change would have cannot be foreseen. Moreover, as the object of Malm is to improve stress whitening properties, a higher ethylene content would be detrimental as described in column 1. Hence, Malm teaches away from the claimed subject matter.

The effect of a different ethylene content can also be seen from the Examples. Table 2 discloses data of polymers prepared according to Malm and of comparative examples. For example, Example 6, which is a comparative example, has an ethylene content of 9.2 wt.%, whereas the polymers of Examples 3, 4 and 5 have an ethylene content of 6.5 wt.%, 5.9 wt.%, and 5.6 wt.% respectively. As can be seen form Table 2, the properties of the polymer of Example 6 are clearly different to the properties of Examples 3, 4, and 5; cf., for example, tensile modulus, Charpy, notched at RT, 0°C and -30°C.

Summarizing the above, it is in no way obvious for the skilled person to change the content of one component in a polymer preparation process and having a high

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

expectation of success. Malm clearly shows that the properties of polymers vary significantly if even if small changes are carried out. Even more, the amendments which have to be carried out in Malm to arrive at the teaching of the instant application would be dramatic (5 wt.% compared to 39-74 mol % in step b; 25-45 wt.% compared to 77-99.9 mol%).

With respective to the second interpretation, the person of ordinary skill in the art would not be motivated to change the step of blending in Malm to a polymerization step as in the instant claims. Blending with a composition vs. polymerization in the presence of a composition are two very different process steps and there is no teaching in Malm that would teach, suggest or motivate the skilled person to amend Malm in such a way to arrive at the subject matter of the instant claims.

Thus, neither the first nor second interpretations of Malm, render the subject-matter of the instant claims obvious. As a result, reconsideration and withdrawal of this rejection is respectfully requested.

- Huovinen et al. (US 6,503,993)

Claims 1, 4, 5, and 7-25 stand rejected as allegedly being unpatentable over Huovinen et al. According to the Office, a person of ordinary skill in the art "*would have a high expectation of success to achieve the production of the polymer blends as herein recited following the steps disclosed in the reference*". Applicants respectfully disagree.

First of all, Huovinen is directed towards the efficient preparation of nucleated propylene homo- and copolymer polymers. The process of Huovinen is based on the use

of a ZN catalyst system modified with a polymerized vinyl compound (cf. column 2, lines 4-25 and column 4, lines 34-51). The actual process of preparing the propylene polymer is secondary. I.e. in column 8 it is only described that different types of reactors may be used and that additionally co-monomers may be added during the polymerization reaction. However, there is no specific combination of reactors given nor is there any disclosure about the contents of the used components. Thus, the skilled man is not provided with any information which reactor systems may be beneficial or which components should be used and in which amount.

Moreover, in the instant claims, two rubber parts (ethylene-propylene rubbers; EPR) with highly differentiated molecular weight are prepared in a polypropylene matrix and the low IV rubber is ethylene rich. Huovinen is totally silent with respect to the preparation of such a polymer composition. Applicants submit that the use of the modified catalyst is the important feature, and not the preparation of various rubbers having different ethylene contents. Starting from Huovinen the person of ordinary skill in the art would not be led to invent the currently claimed subject matter. Thus, the claims are not rendered obvious by Huovinen.

The Office also refers to "*the many Examples*" to support its opinion. However, none of the Examples (which are summarized below) provide information that would lead the skilled person to the claimed subject matter.

- Example 1: the preparation of the catalyst is described;
- Examples 2 to 5: one loop reactor and one gas phase reactor is used; only propylene is used;
- Examples 6 and 7: the preparation of catalysts is described;

- Examples 8 to 10: two loop reactors and one gas phase reactors are used; ethylene is only added in the last step of the process;
- Examples 11 to 13: utilization of the polymers;
- Example 14: two loop reactors and one gas phase reactor are used; ethylene is only added in the last step of the process.

Thus, in all Examples a different reactor system is used when compared to the instant claims. Further, in none of the Examples are two different EPR rubbers prepared. In addition, none of the above Examples teach anything about specific ratio of propylene and ethylene (besides the fact the ethylene is only used in the last reactor; if at all). In this respect the Office states that "*[m]anipulation of monomer content is shown variously throughout the reference*" and specifically mentions column 17, lines 37-40. However, the "*desired amount*" is not providing the skilled person with any information about the actual amount or how this amount should be manipulated, in particular in view of the amounts of other components. But besides the reactor system, the specific ratio of the monomers is the decisive feature of the instant claims and it is not taught or suggested in Huovinen. Thus, the Office has not established a *prima facie* case of obviousness.

Further, Office states that "*[t]he motivation to manipulate these monomers is shown, regardless whether applicants ignore the teachings, as pointed out*". Applicants respectfully disagree.

The manipulation of monomers is not shown in Huovinen. Instead, Huovinen is totally silent about the ratio of monomers and their manipulation. Only control of the amount of hydrogen is disclosed, but without stating what this amount is; not to mention

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

that this statement is made in connection with comparative examples and not in connection with the process of Huovinen (cf. column 16). Applicants submit that a "*desired amount*" is vague and cannot be taken as evidence for adjusting the amount of a monomer.

Finally, even if Huovinen would have mentioned any amount, it is not trivial or obvious to amend the content of a component and having "*high expectation to arrive at the instantly claimed invention*" as stated by the Office. In this respect it is referred to the argumentation above. Moreover, the considerable effect of changing the content of ethylene can also be taken from Examples 8 to 10. It can also be taken from Table 3, which shows that even small changes in the content of ethylene have a considerable effect on the properties of the polymers.

Thus, summarizing the above, Huovinen does not teaching a) preparing two different EPR's, b) the specific reactors system as claimed, and c) different amounts and ratios of ethylene and propylene. Thus, the Office has not established a prima facie case of obviousness. Further, Huovinen does not provide a person of ordinary skill in the art with a teaching or suggestion regarding how the above features can be obtained and how a polymer having improved scratch resistance can be prepared.

In light of the above, Applicants respectfully requests reconsideration and withdrawal of obviousness rejections.

CONCLUSION

Applicants respectfully contend that all requirements of patentability have been met. Allowance of the claims and passage of the case to issue are therefore respectfully solicited.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002

Should the Examiner believe a discussion of this matter would be helpful, he is invited to telephone the undersigned at (312) 913-2114.

Respectfully submitted,

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By: Brad Crawford

Bradley W. Crawford
Reg. No. 50,494

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Suite 3200
Chicago, IL 60606
Tel: (312) 913-0001
Fax: (312) 913-0002